Rec. Price $1.50

Vol. 10 No. 2 20th February, 1979

HERPETOFAUNA

Hoplodactylus duvauceli

"Herpetofauna" incorporates the "South Australian Herpetologist" and the "Bulletin of Herpetology" and is published by the Australasian Affiliation of Herpetological Societies. Its member societies are:

AUSTRALIAN HERPETOLOGICAL SOCIETY

President	:	Richard Wells
Secretary	:	Kim Kennerson
Correspondence to	:	P.O. Box R79, Royal Exchange, Sydney 2000

NEW ZEALAND HERPETOLOGICAL SOCIETY

President	:	Brian Humberstone
Secretary	:	Rod Rowlands
Correspondence to	:	6 Tobruk Cres., Milford, Auckland 9, N.Z.

SOUTH AUSTRALIAN HERPETOLOGY GROUP (INC.)

President	:	Julian White
Secretary	:	Graham Armstrong
Correspondence to	:	S.A.H.G., c/- S.A. Museum, North Tce., Adelaide, S.A. 5000

VICTORIAN HERPETOLOGICAL SOCIETY

President	:	Brian Barnett
Secretary	:	Peter Heazelwood
Correspondence to	:	22 Eaton St., Melton South, Vic., 3338

WESTERN HERPETOLOGY GROUP

President	:	Peter Mirtschin
Secretary	:	Greg Johnston
Correspondence to	:	16 McEwin St., Whyalla Playford, S.A. 5600

****

The Affiliation's objects are:

1. To promote the scientific study of amphibians and reptiles.
2. To promote an active interest in conversation and in particular of amphibians and reptiles and their habitats.
3. To publish and distribute the journal known as "Herpetofauna".
4. To promote liaison between the member Societies and between indivuals through field work, conventions, the distribution of "Herpetofauna" and the distribution of other information.
5. To facilitate representation at the national and international level of its member societies' interests, particularly where a unified stand is needed.

****

Australasian Affiliation of Herpetological Societies.

Convenor	:	Harry Ehmann, c/- Dept. of Herpetology, The Australian Museum, College St., Sydney 2000
Editor	:	Gerry Swan, P.O. Box R307, Royal Exchange, Sydney 2000.
Councillors	:	AHS - Glenn Laycock NZHS- Rod Rowlands SAHG- Julian White VHS - Brian Barnett WHG - Peter Mirtschin

****

EDITORIAL.

The Second Convention of the Australasian Affiliation of Herpetological Societies will take place at Whyalla on the 16th - 19th March. Make sure your Society is represented at the highest possible level.

****

An Appreciation — Peter Rankin.

Associates and friends of Peter Rankin were very much saddened to learn of his tragic death following a fall from a tree whilst engaged in field work in New Caledonia.

Peter was a member of the Australian Herpetological Society for over 8 years joining when he was still at school. During that period he maintained an active interest in the affairs of the Society and served as secretary for several years.

Over the years a steady stream of notes and articles flowed from his pen most of which have appeared in Herpetofauna. Notable among these was his 1973 paper on Sphenomorphus tenuis which won for him a prize as the best article submitted in that year. This was indicative of the standard of Peters work that was to expand in the following years to his latest publication in the Records of the Australian Museum.

During the 1974 student vacation Peter worked in the Australian Museum and from then onwards was a regular visitor and part-time worker in the Herpetology Department. Under the guidance of Drs. Cogger, Greer and Storr, Peter was shown the techniques and given the encouragement to constructively pursue a career in herpetology. He completed a Batchelor of Arts degree, majoring in Science at Macquarie University in 1978 and was to commence an Honours program this year.

His unfortunate death, which cut short such a promising career left his many friends grieving but he will be remembered for his enthusiasm and the zest with which he tackled the matter on hand.

Publications:

(1972) Notes on the Swamp Snake (Drepanodontis signata) in captivity, Herpetofauna 5(2)

(1973) Lizard mimicking a Snake - Juvenile Tiliqua casuarinae, Herpetofauna 5(4)

(1973) The Barred Sided Skink (Sphenomorphus tenuis tenuis Gray), in the Sydney Region, Herpetofauna 6(1)

(1975) Exploitation of a Woodpile in Northern Queensland by a Community of Amphibians and Reptiles, Herpetofauna 7(2)

(1975) Successful Treatment of Advanced Pneumonia in a Captive Snake, Herpetofauna 7(2)

(1976) Mating of Wild Red Bellied Black Snakes, Pseudechis porphyriacus (Shaw), Herpetofauna 8(1)

(1976) A Note on a Possible Deversionary Defence Mechanism in the worm Lizard, Aprasia inaurita Kluge, Herpetofauna 8(2)

(1977) Burrow Plugging in the Netted Dragon, Amphibolurus nuchalis, with Reports on the Occurrence in Three other Australian Agamids. Herpetofauna 9(1)

(1978) Notes on the biology of the Skink Sphenomorphus pardalis (Macleay) including a Captive Breeding Record. Herpetofauna 10(1)

(1978) A New Species of Lizard (Lacertilia:Scincidae) from the Northern Territory, closely allied to Ctenotus decaneurus Storr, Records of the Aust. Mus. 31(10)

In Press. A Taxonomic Revision of the Genus Menetia (Lacertilia:Scincidae) in the Northern Territory.

A New Lizard in the Genus Ctenotus (Lacertilia:Scincidae) from the Northern Territory with notes on its Biology.

Notes on the Reproduction of Children's Pythons (Liasis childreni) Gray 1842.

By Tony Sheargold, 126 Kennedy Parade, LALOR PARK. NSW 2147.

Abstract -

Three instances of egg laying and subsequent incubation under artificial conditions are described for Liasis childreni. The same male and female specimens were responsible for the clutches but mating was not observed. Synchronous emergence of young from the eggs is reported.

First Clutch -

On the 13th November 1976 an adult Children's Python under the author's care produced a clutch of nine white ovoid eggs. Laying took place during early morning (approximately 0830 HRS) in a heated enclosure with fine mild weather conditions. The female coiled around eight of the eggs and layed the ninth soon after. The mass, along with the single egg was removed so that artificial incubation could be attempted.

Incubation Procedure - First Clutch

A wooden container measuring 45cm X 30cm X 30cm was obtained and heated with a 40 watt incandescent globe; a thermostat kept the temperature at 30°C. The box was covered with styrene foam to prevent excessive heat loss. The whole clutch of nine eggs was placed in a plastic bag containing damp peat moss which completely covered the eggs. This bag was then sealed and placed in the box.

The bag was inspected eleven days later (24th Nov.) at which time it became apparent that the eggs were becoming more rounded. It was noted that one egg had acquired a fungus-like growth which was restricted to one end. Further examination of the eggs took place on 4th Dec. (21 days after laying) and the growth-affected egg was removed from the mass for it was obvious that the fungus (?) had spread and contamination of the other eggs was a possibility. This egg was opened and found to contain a developing embryo.

Hatching - First Clutch

The first hatchling appeared at approximately 2300 HRS on 8th Jan., 57 days after laying. It was followed soon after (within an hour) by another. It was interesting to note that upon experiencing visual disturbances (the author's presence), both would withdraw completely into their egg cases.

During the morning of the following day (9th Jan.) the third specimen hatched, but it remained within the egg case behaving in much the same manner as the first two hatchlings.

Of the remaining five eggs only two reached hatching point, one emerging partially on 11th Jan., the other during 12th Jan.

The other three eggs were opened on the 15th Jan. as it appeared that they were not going to hatch. All were found to contain young at various stages of development. One had terminated at an early stage of growth. Another specimen, apparently perfectly formed - possibly only hours from hatching - was found dead, entangled by the umbilical cord to such an extent that at the point of entanglement on the body a distinctive band of constriction resulted.

The last egg, also dead was at the same stage of growth as the latter; no explanation is offered for it's failure to hatch.

Second Clutch -

Limited accurate information is available for the second clutch.

About the 17th November 1977, the same female produced another mass of eggs, this time numbering 13; they were similar in shape and colour to those that composed the first clutch. It was not possible to determine the precise time of laying and the weather conditions were not recorded.

The mass of eggs was deposited in another heated enclosure. When discovered the female was coiled tightly around the eggs, almost completely covering them. Initially the clutch was left with the female in the hope of achieving a higher success rate than previously. However, after 2 weeks the eggs appeared to be drying out, and one appeared to have been badly squashed by the female's body coils. The eggs were then removed so that artificial incubation could be attempted.

Incubation Procedure - Second Clutch

The same incubator and heat source were employed, however the thermostat was adjusted to provide a temperature peak of 27°C. The styrene foam was removed from the incubator. In making these slight adjustments, it was hoped that the period of incubation would be lengthened as it was felt that the first clutch may have developed too rapidly. Damp peat moss was again used, but this time the clutch was placed in a plastic container, which was then positioned in the incubator. Regular inspection ensured the peat moss remained slightly damp.

Hatching - Second Clutch

On the 3rd February 1978 (approximately 77 days after laying) it was decided to inspect two eggs that appeared to have failed. One revealed a live specimen when opened perhaps only hours from hatching. The young snake fell out of the split egg case, with the yolk sac still attached; it was then placed on a piece of plastic sheet and returned to the incubator in the hope that it would survive. Two days later (5th Feb.) the umbilical cord separated from the juvenile, the specimen appearing to be unharmed; it eventually developed as normally as the rest of the hatchlings. The other suspect egg was not opened for fear of repeating the mistake.

After approximately 81 days of incubation (7th Feb.), almost the entire clutch had hatched (11) exclusive of the specimen accidently disturbed. Hatching began on 4th Feb. and continued up to 7th Feb. the last egg (the one that had been examined earlier) was opened on 13th Feb. and was found to contain a dead embryo at an early stage of development; this was the egg that the female appeared to have crushed just after laying.

Those that hatched remained within their egg cases for periods of a few hours to a few days. It appears that there is a cue that allows synchronous emergence of the juveniles, for none would venture from the egg case until all had finalised hatching - then and only then did actual emergence of the young take place. Total clutch emergence was not "automatic" once the last had hatched; all remained within the egg cases for some time before emerging in quick succession. This phenomenon occurred in both clutches.

Third Clutch -

On the 14th November 1978, 12 eggs were produced in the same enclosure as that used in the second clutch. With the exception of a reddish-brown stain on the base of each egg, all were much the same in colour and form as the other clutches. The eggs were layed during daylight at around 1700 HRS (E.S.T.), when the outside air temperature was 22°C and the cage temperature 26.5°C.

Soon after laying, 5 of the eggs were removed from the mass (which the female had coiled tightly around) and placed under the same incubating conditions as clutch 2. This procedure was adopted to determine incubation differences. The female then returned to coil (this time somewhat loosely) around the other 7 eggs. Unfortunately the female uncoiled from the remaining eggs at about 2000 HRS on 17th Nov. and fed on three mice. It returned to the eggs but did not coil around them, just covering them with her body. The female remained in this position for two days (19th Nov.) and by 21st Nov. it was apparent that it had abandoned it's incubation. These eggs were then placed with the others in the incubator.

Regular inspection (without handling) from 21st Nov. to 8th Dec. indicated that the entire clutch had failed. There was a pungent odour emanating from the incubator and the appearance of the eggs suggested they were not developing (dehydrated, solid and somewhat reduced in size).

On 8th Dec. all eggs were opened and found to be solid masses inside, and rather "rubbery" in texture. What appeared to be blood vessels were present in at least one egg, but the others also had unidentifiable red stains present.

Acknowledgements -

I would like to thank Charlie Robson, Richard Wells and John Cann for their comments. advice and encouragement.

****

The Occurrence of some Exotic Reptiles and Amphibians in New Zealand.

By J.A. West, 4 Cradock Street, Avondale, AUCKLAND 7. N.Z.

A summary of the occurrence of some exotic species of reptiles and amphibians that have been either imported deliberately or have accidentally arrived in New Zealand is given along with discussion on the present distributions of established species.

Reptilia: 1 Squamata

a) Lizards:

A number of exotic species of lizards have arrived in New Zealand mainly as accidental importations on foreign cargo.
Several specimens of the Viviparous Lizard Lacerta vivipara were seen on the Tinakori Hills, Wellington in 1885. It was concluded (Thomson 1922) that these specimens arrived in a consignment of exotic plants destined for the Botanical Gardens and were not seen again after the first year.
A single specimen of the Australian Slow-worm Pygopus lepidopodus was observed in Taranaki Street, Wellington in May 1921 (Oliver 1921). The specimen was immediately killed by it's discoverer and was later placed in the Dominion Museum, Wellington.

Lepidodactylus lugubris and the Oceanic Gecko Gehyra oceanica have been reported from Flat Island in the Mokohinau Islands (35°47'S 175°12'E). Both geckos were accidental arrivals and have not become established. 5 specimens of Gehyra mutilata and 3 of Cnemaspis kendalli were found in the holds of M.V. Wairata which contained a consignment of scrap metal loaded from New Guinea and New Britain (McCann 1955).
Hemidactylus garnoti was reported from a cargo of fruit but has not become established.

The following Australian skinks have been recorded in New Zealand:
Lampropholis mustelina was found in a shipment of potatoes at Tauranga (37° 36S 176° 10E), June 1952.
L. challengeri was taken from a cargo of imported fruit (McCann 1955). Egernia cunninghami and Sphenomorphus quoyii have also appeared in N.Z. The only established introduced skink to date is L. delicata, believed to have been accidentally transported in cargo (Robb 1973, 74). It has been found 'breeding in some areas around Auckland city'. The distribution of this small skink has recently extended to Ruakura, Hamilton (37°47S 175°19E) and Te Puke (37°46S 176° 22E). Observations of 2 specimens is captivity since 17 April 1978 have shown it capable of successfully competing for food with the endemic skink Cyclodina aenea. It is probable that L. delicata will rapidly spread through the North Island.

b) Snakes:

There are no authentic records of snakes having been established in N.Z. McCann (1966) notes that, 'foreign snakes have appeared in cargoes of timber, fruit and other goods'.
2 species of marine snakes occasionally get washed up on the coast. The Banded Sea Snake Laticauda colubrina has been taken from East Cape (37° 42'S 178°35'E) in 1819 and Russell, Bay of Islands (35°16'S 174°8'E) in 1880. A live specimen was captured by Mr. M. Hart in the winter of 1973 and was kept alive at the Auckland Zoological Park. It was later destroyed by the Department of Agriculture. The Bi-colour or Yellow bellied Sea Snake Pelamis platurus is a more common visitor and is frequently washed up on the west and north-east coasts of the North Island. The most recent arrival of this snake was at Muriwai Beach West Auckland (36°50S 174°30E) early in 1978.

2 Chelonia

Freshwater and terrestrial chelonians used to be imported into N.Z. by pet dealers and private individuals before the present importation restrictions which were introduced during the 1960's.

a) Terrapins:

Numbers of Red-eared terrapins Pseudemys scripta elegans and long-necked terrapins Chelodina longicollis still exist in captivity. Large numbers of juveniles P. scripta elegans made a brief appearance in Auckland during August 1976. There have been numerous escapes from captivity. The Auckland Zoological Park has approximately 3 to 4 chelonians per year brought to them found wandering about the city (D. Pepper-Edwards pers. comm.). Encounters with wild terrapins are few. In 1903 terrapins were discovered in North Invercargill near the Waihopai River (41°42S 173° 34E). McCann (1966) reports the capture of a live C. longicollis in Wellington Harbour. The specimen no doubt had just been liberated from a visiting vessel.

b) Tortoises:

Tortoises were also imported into N.Z. Such species included the Box Tortoise Terrapene carolina, Gopher Tortoise Gopherus polyphemus Mediterranean Spur thighed Tortoise Testudo graeca, Hermann Tortoise Testudo hermanni and the Margined Tortoise Testudo marginatta. Some have been successfully bred in large numbers and maintained in captivity.

In 1913 a number of Japanese tortoises (possibly either Clemmys japonica or Damonica reevesi) were imported from Japan and kept in one of the Auckland Domain's green-houses throughout the winter. However by the following spring all had escaped and were never seen again. Despite escapes of captive chelonians no wild populations have established themselves.

c) Turtles:

Marine turtles frequent N.Z. waters and occasionally get washed ashore. Species found ashore are the Luth Dermochelys coriacea, the Green Turtle Chelonia mydas, the Hawksbill Turtle Eretmochelys imbricata and the Loggerhead Caretta caretta. Most specimens have been recorded from the west coast of the North Island.

Amphibia: 1 Anura

a) Frogs:

4 species of Tree frog (Hylidae) have been introduced into N.Z. by acclimatisation societies, the Dept. of Agriculture and private individuals. The frogs were to provide duck food and reduce mosquito populations.

In 1867 the Auckland Acclimatisation Society received 2 specimens of the Golden Bell Frog Litoria aurea followed by several small consignments in 1868. Their numbers rapidly increased and are now common throughout the N.I. The Canterbury Accl. Society received L. aurea in 1867 from Hobart Tasmania and tadpoles from private individuals. Spawn was successfully hatched in 1868 by the Southland Accl. Society and frogs distributed throughout the Southland Plains. By 1890 it was apparent that they didn't thrive. Similar results were experienced in Otago with 60 frogs from Napier in 1896. In 1878 L. aurea was liberated in Rotorua (38°9S 176° 16E) and were recorded as being numerous in 1916 (Thomson 1922). It has rapidly spread throughout the North Island.

It's present distribution is most of the N.I., the northern tip of the S.I. and Christchurch; occurring in areas of suitable habitat (fig. 1A). Of particular interest is its occurrence in Southland, which is the Southern most limit of the species.

No specific mention of the introduction of L. raniformis has been documented. This frog is similar to L. aurea and was probably introduced with that species. Little is known of it's distribution in N.Z. but probably follows that of L. aurea.

A somewhat smaller species, the Brown or Whistling Tree Frog L. ewingi was introduced into N.Z. in 1875. A Mr. W. Perkins brought some over from Tasmania in a bottle and released them in a drain in Alexandra St, Greymouth (42°28S 175°29E). They soon spread 24 miles up the Gray River Ahura. In 1900 frogs from Greymouth were released in Hokitika (42°42S 170°59E) but have since been largely displaced by L. aurea. In 1946 an attempt to establish L. ewingi in the N.I. failed, but a second attempt at Himatangi succeeded.
The present distribution of L. ewingi is a localized area around Foxton (40°27S 175° 18E) in the N.I., and the West Coast and Southland in the S.I. (fig. IB)

The Great Green Tree Frog L. caerulea was introduced in 1897. 72 specimens were obtained by the Dept. of Agriculture from Sydney followed by a second consignment in 1899. These were liberated in the Hawkes Bay district. Further specimens were released in Wellington, Paraparaumu (40° 55S 175° OE), Motuihe I. (36°45S 174° 58E), Nelson (41°18S 173°17E) and Moumahaki.Sightings of L. caerulea are few. An adult was found in Wanganui (39°56S 175°0E) in 1949 and tadpoles were taken at Inglewood, Taranaki (39°7S 174°13E) in 1952 and at Puketaha in 1957. The survival of L. caerulea in N.Z. is open to speculation although McCann (1961) considers that it is 'likely that this highly camouflaged, arboreal frog has so far escaped attention and still survives in suitable localities'.

All attempts at establishing 2 species of European frogs in N.Z. have failed. 30 European Brown Frogs Rana temporaria were imported to Canterbury in 1864 but died soon after arrival. Large edible frogs, possibly Rana esculenta were introduced into Nelson and were never seen after liberation.

b) Toads:

A number of Common Toads Bufo vulgaris were liberated in a swamp at Repongaere Station near Gisborne (38°41S 178° 2E) in 1893. These were seen for a few years before their disappearance.
Toads (Bufo) used to be imported from Fiji and other Pacific Islands for use in Medical tests by hospitals (McCann 1961).
To date no wild population of Toads has become established.

2 Urodela

The Axolotl or 'Mexican Walking Fish' Ambystoma mexicanum used to be imported by pet dealers and success in breeding has maintained captive populations in N.Z. Liberation into pond and stream by private individuals in attempts to establish wild populations have, to the benefit of native fish, failed.

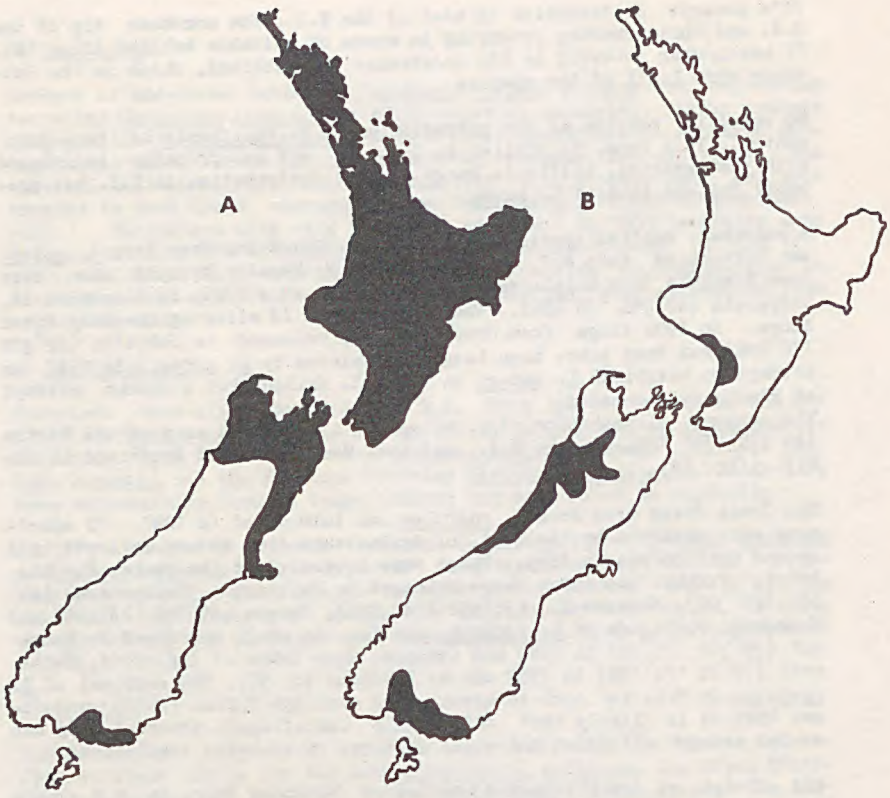


FIG. I. DISTRIBUTION OF LITORIA IN N.Z.: A) L. aurea, B) L. ewingi.

REFERENCES:

BELL, B. 1971: N.Z. Frogs and their Identifications. Pepeke 1(17): 1-6.
1972: Progress Report on the Frog Distribution Survey. 1(23): 1-4.

CHEESEMAN, T.F. 1892: On the occurrence of the Luth or Leathery Turtle on the Coasts of N.Z. Trans. N.Z. Inst. 25: 108-110.
1907: Notes on the occurrence of certain Marine Reptilia in N.Z. waters. Trans. N.Z. Inst. 40: 267-269.

CLARKE, F.E. 1878: Notice of a Tadpole found in a drain in Hokitika. Trans. N.Z. Inst. 11: 573.

KIRK, T.W. 1886: On the occurrence of the English Scaly Lizard (Zootoca vivipara) in N.Z. Trans. N.Z. Inst. 19: 67-69.

MARRINER, G.R. 1906: On the presence of another Australian frog in N.Z. Trans. N.Z. Inst. 39: 144-149.

McCANN, C. 1955: The Lizards of N.Z. Dominion Museum Bulletin. 17. Wellington.
1961: The Introduced frogs of N.Z. Tuatara 8(3): 107-120.
1966: The Marine Turtles and Snakes occurring in N.Z. Rec. Dom. Mus. 5(21): 201-215.

OLIVER, W.R.B. 1921: Occurrence of the Australian Slow-worm in N.Z. N.Z. Journal of Science & Technology 4(45): 263.
1925: Occurrence of the Leathery Turtle in N.Z. N.Z. Journal of Science & Technology 7(5): 297.

PARKER, R.S. 1973 (Nov, Dec.), 1974 (Feb): Tortoises in Captivity. N.Z. H.S. Auck. Branch Newsletters.

PHILLIPS, W.J. 1941: Recent occurrence of Pelamis platurus Linn. in N.Z. Trans. N.Z. Inst. 71: 23.

ROBB, J. 1973: Reptiles & Amphibia. pp 285-303 in WILLIAMS, G.R., The Natural History of N.Z. Reed, Wellington.
1974: N.Z. Lizards (2). N.Z. Nature Heritage 2(25): 681-9.

THOMSON, G.M. 1922: The Naturalisation of Animals & Plants in N.Z. pp 178-184. Cambridge University Press, London.

****

The Reptiles of the Sir Joseph Banks Islands, South Australia.

By G.R. Johnston & P. Ellins, 16 McEwin Street, Whyalla Playford, S.A.

The Sir Joseph Banks Group consists of seventeen islands situated 22 kilometres south-east of Tumby Bay in Spencer Gulf, South Australia. The coordinates of the Group are 34° 34'S Latitude and 136°25'E longitude. With the exception of Spilsby island the group constitutes the Sir Joseph Banks Group Conservation Park.

It was Matthew Flinders who, in 1802 whilst surveying the southern coast of Australia, first charted the group and named it in honour of the then president of the Royal Philosophical Society of London to whose exertion and favour the voyage was greatly indebted. The names of the islands were derived from Lincolnshire villages, near one of which Sir Joseph Banks lived-namely Reevesby Abbey.

The highest point in the group is 49.4m above sea-level and can be found on the southern end of Spilsby Island. The northern part of the group, except Dalby and Kirby Island, rises from a shoal about 14.5 km long as defined by the five fathom line; the more southerly islands are separated by deeper water. All islands in the group consist of a complex

of ancient igneous and sedimentary rocks partly over laid by consolidated dune limestone (probably of post tertiary age) and recent unconsolidated sand dunes (Mahony, 1938). The area receives an annual rainfall of about 380 mm.

The most recent account of herptiles occurring on the group is that of Tubb (1938).

The information presented in this report is based on the Report of the McCoy Society (1938), South Australian Museum Records and observations made by the author and fellow members of the Western Herpetology Group. The systematic list of the islands' reptiles is arranged alphabetically by genus and species within each family.

SQUAMATA: SAURIA
GEKKONIDAE

Phyllodactylus marmoratus (Marbled Gecko)

This species was reported from Reevesby, Spilsby, Roxby, Stickney and English Islands by Tubb and is represented by specimens from Reevesby and Lusby Islands in the South Australian Museum. Being nocturnal in habit it was found by the McCoy Society under stones, in the debris at the bases of shrubs or tussocks or ascending the branches of the undergrowth. In 1977 it was found by the author beneath boards in the samphire area north of the homestead on Reevesby Island.

VARANIDAE
Varanus gouldii (?) (Gould's Monitor)

Regarded as a form of the Lace Monitor (Varanus varius) by Tubb, this species was found to be common on Reevesby Island in 1938. Two specimens have been collected by the Western Herpetology Group on Reevesby Island and no specimens have been lodged with the South Australian Museum. Apparently introduced to Spilsby Island.

SCINCIDAE
Cryptoblepharus boutonii (Bouton's Snake-eyed Skink)

Recorded from Reevesby, Roxby and Stickney islands by Tubb and from Reevesby and Partney Islands by the author. No specimens representing this species are in the collection of the South Australian Museum.

Ctenotus uber orientalis (Striped Skink)

One specimen, recorded as coming from Reevesby Island, is present in the South Australian Museum. The author has also seen this species on Reevesby Island.

Hemiergis peronii (Peron's Skink)

This colourful little skink was recorded from Reevesby, English, Stickney, Roxby and Marum Islands by Tubb, and from Reevesby and Partney Islands by the author. The South Australian Museum has specimens from Spilsby and Lusby Islands.

Leiolopisma entrecasteauxii (Entrecasteaux's Skink)

One specimen of this species was found, by the author and N. Broadhead, under a board in the samphire area to the north of the Reevesby Island homestead in 1977 and was subsequently lodged in the South Australian Museum. This proved to be quite a significant find, as this species has been recorded from only three localities in South Australia - Elliston, Flinders Island and Neptune Island.

Lerista frosti (Frost's Burrowing Skink)

Recorded by Tubb, Western Herpetology Group and South Australia Museum only from Reevesby Island.

Lerista picturata (Two-toed Burrowing Skink)

Recorded only from Reevesby Island by all sources.

Menetia greyii (Grey's Skink)

Tubb records this species from Reevesby Island.

Morethia adelaidensis

Specimen present in the South Australian Museum from Reevesby Island.

Trachydosaurus rugosa (Sleepy Lizard)

Found to be common on Reevesby, Duffield, Spilsby, Hareby, Kirkby, Langton and Winceby Islands by Tubb. Observed on Reevesby Island by the author.

SQUAMATA: SERPENTES
ELAPIDAE

Acanthophis antarcticus (Death Adder)

This species is recorded from Reevesby Island by a specimen in the South Australian Museum. Also one specimen was recorded in September 1978 by P. Brown and P. Mirtschin (pers. comm. P. Brown and P. Mirtschin, 1978).

Notechis ater niger (Peninsula Black Tiger Snake)

A Museum specimen is recorded from Roxby Island. The author has seen specimens from Reevesby and Roxby Islands and Tubb records this species from both of these localities, he also stated that the lessee of Spilsby Island in 1938 reported that 'Black Snakes' has been plentiful on that island but had been completely exterminated by 'Goannas' (Varanus sp.) which had been introduced from the mainland. Reported from Sandy Bligh Island by G. Richardson (pers. comm. 1977).

This species is recorded as feeding on White-faced Storm Petrels (Pelagodroma marina) by Tubb (1938) and by B. Ingall and P. Hudson (pers. comm. 1977). In December 1977 members of the Western Herpetology Group observed a snake of this species feeding on juvenile Silvereyes (Zosterops lateralis on Reevesby Island. This occurrence was filmed by the A.B.C. and was shown in the series "The way I see it".

F.G. Morgan (1938) provides an account on the venom of this species for readers who are interested.

DISCUSSION

The islands forming the Sir Joseph Banks Group are considered to be part of Fenner's Spencer-Vincent Sunkland and have the same geologic history as the adjacent Mainland (Hudson, 1978). Thus it was expected, and subsequently found, that there are close affinities between the islands' reptiles and those of the adjacent mainland.

ACKNOWLEDGEMENTS

Thanks are due to members of the Western Herpetology Group who provided much information and to Dr. T.F. Houston.

REFERENCES

Hudson, P. (1978) Preliminary Report outlining activities arising from Scientific Permit 201, unpublished.

Mahony, D.J. (1938) The Sir Joseph Banks Islands, 1 General Introduction Proc. Roy. Soc. Vict., Vol. 50, 303-4.

Morgan, F.G. (1938) The Sir Joseph Banks Islands, 12. Reptilia Part 2: The Venom of Notechis scutatus variety niger, (Reevesby Island), Proc. Roy. Soc. Vict., Vol. 50, 394-98.

Tubb, J.A. (1938) The Sir Joseph Banks Islands, 11. Reptilia Part 1 : General, Proc. Roy. Soc. Vict., Vol. 50, 383-393.

****

Notes on Incubation and Hatching of Eggs of the Eastern Water Dragon.

by J. Smith, 7 Jeffrey Road, Vale Park, S.A. 5081.

Ten eggs laid by an Eastern Water Dragon (Physignathus lesueurii) which had been kept in captivity by Mr. R. Hancock were given to me because of previous successes in hatching Bearded Dragon eggs.

The eggs were placed on top of moist, sterile, fine gravel in an airtight container. The use of an airtight container reduces the rate of evaporation. The eggs were numbered with a felt pen to facilitate identification when taking measurements. The container was then placed on top of a refrigerator, at the back where the heat generated rises. I have tested this area with a thermometer and found that it remains at a fairly constant temperature during the summer, which is essential as large temperature fluctuations can cause death of the embryo.

The eggs were regularly sprayed with water to keep them moist, and were found to absorb a lot of water. There was considerable expansion during the incubation period, more so in width than in length. The maximum growth was in egg number 9 which increased in width by 8.76mm, but the

average increase was approximately 7.5mm. The eggs were also noted to decrease slightly in length during the first few weeks, then to increase again. Measurements were taken fortnightly using vernier calipers.

Date / Egg No.		2nd Nov. 1975	17th Nov. 1975	2nd Dec. 1975	16th Dec. 1975	30th Dec. 1975	13th Jan. 1976	27th Jan. 1976	date hatched	total length in mm.
1	L	30.70	30.25	30.63	30.98	31.78	33.10	33.75	8-2-76	159.50
	W	15.90	17.00	19.71	21.10	22.06	22.76	22.86		
2	L	29.95	29.70	29.53	30.20	31.27	33.03	34.17	8-2-76	150.03
	W	15.40	16.90	19.47	20.92	21.96	22.81	22.90		
3	L	26.68	26.00	26.39	27.26	28.12	29.61	31.34	8-2-76	149.19
	W	16.50	18.10	20.91	22.04	22.72	23.39	24.00		
4	L	27.14	26.80	27.20	28.05	29.66	31.34	32.50	8-2-76	151.45
	W	16.04	18.00	20.95	22.69	23.43	23.84	23.72		
5	L	27.20	26.80	26.45	27.14	27.91	28.75	30.15	6-2-76	150.84
	W	15.54	17.30	19.86	21.12	21.72	22.40	22.89		
6	L	27.24	26.64	26.40	27.22	28.25	28.97	30.63	8-2-76	156.39
	W	16.50	17.89	20.70	21.92	22.96	23.13	23.91		
7	L	28.60	27.86	27.72	28.75	29.70	30.49	31.20	7-2-76	155.26
	W	16.32	17.70	20.26	21.54	22.64	23.00	23.18		
8	L	26.40	26.15	26.29	27.41	28.87	29.20	31.02	6-2-76	154.86
	W	15.69	17.20	19.99	21.62	22.66	23.22	24.15		
9	L	27.10	26.56	26.80	27.92	29.16	29.69	30.64	8-2-76	151.30
	W	16.47	18.64	21.07	23.18	23.95	24.72	25.34		
10	L	26.12	25.60	25.67	26.70	27.75	28.45	29.27	8-2-76	148.05
	W	16.54	17.89	20.49	22.01	23.20	23.90	24.32		

L = Length W = Width

All 10 eggs hatched within 2 days of each other, three months after laying. The young survived in an outside pit for 6 months. At this time one died, possibly it was not able to compete for the available food. Six were distributed to other herpetologists and three retained, which continue to do well and grow rapidly. Food consists mainly of mince

which is taken readily and fought over. Other food items are mealworms, grasshoppers, moths and other insects, and a small amount of fruit. The lizards have already shed 30-40 times and are frequently seen sitting in the middle of the water dish on warmer days. They have also been seen out in the rain on cold wintery days when they are still active (but not eating) although other lizards are all under cover.

****

Thermoregulation in Agamids.

By Nick Gambold, 26 Avenhurst Drive, Glen Waverley, Vic. 3150

Reptiles are regarded as cold blooded land animals by many people, but this is not entirely true as reptiles can in fact produce between 5 and 10 per cent of their own body heat through metabolism of foodstuffs. However this rate of heat production is minimal and would only serve to augment the overall body temperature. Consequently these animals must attain their preferred body temperature through heat absorption from their surroundings. Because this is so, reptiles (and in particular lizards in the family Agamidae) have evolved many elaborate means of heat control.

The first problem is raising the body temperature, and basking is the major means although several other practices are employed to hasten this procedure. With the help of hinged ribs, members of the dragon family are able to increase their dorsal surface area. This area is also extended by filling the lungs with air. To aid heat absorption many of these lizards are also able to darken their colour by means of a hormone produced by the pituitary gland, thereby decreasing dermal reflection. During this basking period, lizards of the family Agamidae are able to markedly raise their pulse rate. This helps circulate blood that has been warmed in the dilated peripheral blood vessels near the skin surface. When keeping these lizards it is well to remember that juveniles are far more sensitive to heat changes than adults and as a consequence regulate their body temperature within a much narrower margin.

When the reptile's preferred body temperature is attained it then goes about feeding and other activities such as mating. During this active period the lizard's behavioural patterns are almost completely non-thermoregulatory. If subsequently the body temperature continues to rise, the lizard's behaviour falls into a heat avoidance pattern.

As heat avoidance is seriously hampered by radiant heat from rocks and sand which may reach temperature of up to 70°C in desert areas, the dragons must raise themselves from these surfaces. This is done either by climbing onto a bush or stick or, more commonly, adopting a "stilting" posture where the body is lifted off the ground by extending the legs. To assist this heat avoidance the lizards when possible lighten their colour to increase dermal reflection. In addition it is usual for these lizards to position themselves parallel to the sun's rays which allows a minimum of body area to be exposed to the sun. If temperatures do reach extremes, dragons may then resort to resting in shade, occasionally scampering out to feed or move to another shaded site. This is

known as "shuttling", the resting (= cooling) periods in the shade allow the lizard to withstand short periods of high temperature. During these periods, panting may be employed. This function increases the circulation of warm air over the wet interior of the lungs and mouth, hence heat is dissipated through evaporation of body moisture.

In conclusion the behavioural patterns of the Agamid lizards can be summarized into three main periods:

1. Heat absorption patterns (basking)
2. Activity period (feeding, mating)
3. High temperature avoidance patterns (stilting, shuttling and panting)

REFERENCES: Bogert, C.M. (1959) How reptiles regulate their body temperature. Scientific American. April 1959.
Bradshaw, S.D. (1977) Reptiles and their adaptation to arid environments, In H. Messel and S.T. Butler (ed) Australian Animals and their Environment. Shakespeare Head Press.

****

A Captive Breeding Record of the Skink *Leiolopisma otagense*.

by G. Watchman, 1266 Fergusson Drive, Upper Hutt. N.Z.

These lizards were collected in central Otago, the female being collected as a juvenile in November 1974, the male as an adult in 1976.

The specimens have been kept in a large outdoor cage, furnished with rock outcrops, a pool of water and low growing plants. The habitat has been left undisturbed and it is considered that this factor played some part in the successful breeding which occurred.

The male and female often bask together but have established private resting and sleeping cavities, which they defend and constantly check when roaming during the day. Intrusion by one into the other's area produced the only animosity this pair have shown towards each other during the time they have been in captivity. They have thrived on a diet of live moths (Porina etc.), showing little interest in flies.

Mating was observed on 4th September 1977 and was very placid. The male lay over the top of the female's body, firmly holding one foreleg of the female in his jaws, and twisted his vent and tail beneath her. The mating lasted twenty minutes.

During January 1978 the female was very large and sluggish, showing little interest in food. The three young were born over a period of three days, 4th-6th February: each one being born in mid-afternoon. This spacing of births was noted in two other females left in my care by another amateur herpetologist and could be a means of spreading the young over the territory, thus ensuring a better chance of survival. The average length of the young at birth was 115mm snout to tip of tail.

The female showed great activity in the days following the birth of the young, roaming and beginning to feed again. The young were very active from birth, and devoured moths of all sizes. Like the adults they show no interest in flies.

Adults and young in captivity and in the wild show great curiosity, and after the first dash to safety, re-emerge within minutes, heads turned sideways to investigate the sudden intrusion. These lizards become very tame in captivity, taking live food from the fingers.

****

Burrow Density, Position and Relationship of Burrows to Vegetation Coverage Shown Rosèn's Desert Skink Egernia inornata (Lacertilia: Scincidae).

by Paul Webber, The Australian Museum, College St., Sydney, N.S.W.

Introduction

In recent years, increasing research has been carried out on the thermoregulatory behaviour in lizards, and a variety of terms used to categorise different aspects of thermoregulation. The term poikilotherm has been used indiscriminatorily to describe all animals, other than birds or mammals, that have a body temperature which varies with that of the surroundings. As such it is inapplicable to most reptiles which maintain a narrowly defined temperature either above or below that of their surroundings (Heatwole 1970, 1976, Cogger 1974).

Cowles and Bogert (1944) used the term ectotherms to describe animals relying on external, or environmental heat sources to maintain body temperature in narrowly defined limits. Heliotherms has been used to describe animals primarily relying on solar radiation as a heat source (Cowles and Bogert 1944; Cogger 1974). The term thigmotherms, is used to describe ectotherms relying on heat exchange from the substrate to maintain their body temperature (Heatwole 1976).

As with most terminology there are exceptions, either where the animal does not fit conveniently into any of these categories or will conversely utilise more than one of these strategies depending upon varying environmental conditions.

Active thermoregulation in reptiles is well documented (see Heatwole 1970, 1976, Cogger 1974, for literature reviews).

Egernia inornata Rosen (1905), described from "Western Australia", is a member of a species group including E. kintorei, E. slateri and E. striata. All are arid or semi-arid adapted species which construct and inhabit a burrow, or burrow network of varying size and complexity (Davey 1970; Bustard 1970; Swanson 1976). The burrows are apparently species distinct (Rankin pers. comm.) but, particularly in E. inornata, are liable to vary in structure in geographically isolated populations of the same species.

This study was conducted at the eastern-most extent of the species range in Western New South Wales between the 20th and 21st May 1978.

E. inornata is a medium sized, stout lizard averaging 75 mm snout/vent, with an overall length of 160 mm. It is found throughout its range in a variety of xeric habitats, preferring sandy or loamy soils. The burrow may have one or several entrances which are usually found at the base of vegetation, or fallen timber. It has been generally accepted that at least one entrance will be positioned in an easterly direction (Cogger 1967; Davey 1970). Usually the terminal burrow end extends to just below the soil crust, the lizard effecting an escape through this if pursued by a predator (Cogger 1967, 1975; Davey 1970; Swanson 1976).

Materials and Methods

The study site had been pegged on a previous visit to the area, giving one hundred squares all 40 feet in size. Each sub-plot was carefully scrutinised for Egernia burrows, the edges of spinifex clumps lifted etc., and the results plotted (Fig. 1). As it was decided to carry out further studies in the area, the burrows were not dug out to see if they were occupied.

Vegetation of each sub-plot was also mapped (Fig. 1) and an attempt made to correlate burrow position with regard to vegetational cover.

The compass bearing of each burrow was determined by extending a ruler along the same plane that the burrow made, and a compass reading taken along the straight edge.

Results and Discussion

The study site was situated in the same general area used by Cogger in his study of Amphibolurus fordi (Cogger 1960, 1969, 1974) at Round Hill Fauna Reserve (33° 03'S, 146°12'E) an area of Mallee Scrub dominated by Eucalyptus foecunda and E. socialis, throughout which the dominant ground cover is porcupine grass (Triodia scariosa). As Cogger (1974) has pointed out, the role of Triodia is extremely important in providing a microclimatic refuge for the arid zone reptiles. Indeed there seems to be a positive correlation between the presence of the Mallee dragon, Amphibolurus fordi, with Triodia, the former not occurring in Triodia free areas.

Egernia inornata has not previously been recorded as exhibiting such a close inter-relationship, probably due to its dependence on a burrow system for protection, thermoregulation and possibly rehydration. Where it is found in association with Triodia the burrow entrances are generally found at the edge and just below the protective periphery of the grass, although sometimes fallen timber or dead vegetation in a sand matrix may be similarly utilised. Cogger (1974) has shown that spinifex is efficient as an insulator from direct solar radiation, as well as maintaining higher humidity within the centre of the plant. This, coupled with the root system providing a binding of the soil immediately below the clump, creates a slightly more stable environment in the soil directly beneath Triodia when compared with that found in more exposed areas. It should be pointed out that in this particular study of E. inornata, the population occurred at the eastern-most extremity of its known range and may possibly be behaviourally atypical of the species throughout the remainder of the range. Indeed Rankin (pers. comm.) has commented on distinct differences in burrow structure between specimens occurring in the Northern Territory, and those examined in this partic-

ular study in New South Wales.

Pre-emergence activity---the ability to raise body temperature by postural attitudes towards solar radiation, whilst the animals still remain in the protective cover of the vegetation, during the cool period of early morning--- has been observed in several species and has been particularly noted in species that have too low a body temperature, during early morning, to have full locomotor ability (Cowles and Bogert 1944; Cogger 1974; Webber 1978). Mcginnis and Dixon (1967) have shown that in superficial burrow areas, lizards are actively able to raise their body temperature and it appears that this method may be well used by E. inornata, and may be of quite definite advantage in reducing the initial "hypersensitive" period occurring during the early stages of true basking, as such a burrow facing in an easterly direction would be of a distinct advantage in shortening this period. This is positively disproved, as Fig. 2 shows a distinct trend towards a northerly direction, with a quite definite skew towards a westerly direction. This is interesting, as activity has been observed to occur well after sunset, and it would thus seem that rather than a rapid rise to optimum body temperature in early morning being of a distinct advantage, the reverse is true, and continued activity into the evening (for reasons as yet not understood) is preferred. Possibly the late sun heating ensures that the burrow temperature maintains its practically constant nature, even though environmental temperature may vary considerably. It has also been noted that where a burrow system has multi-entrances there is a shift of activity between these mouths during the day, the lizard spending more time at whichever burrow entrance faces the sun, and in this previous study the crepuscular activity occurred at the western-most facing burrow. (Webber 1978)

The association between burrow distribution/density and Triodia dominance is clearly illustrated by Fig. 1 and was, in fact, to a far greater degree than was estimated from casual observation. However, as the burrows were not dug out, it is uncertain as to whether all were occupied, and as such the results should not be taken as relative density of E. inornata in this study area, but rather as the extent of relative burrow activity.

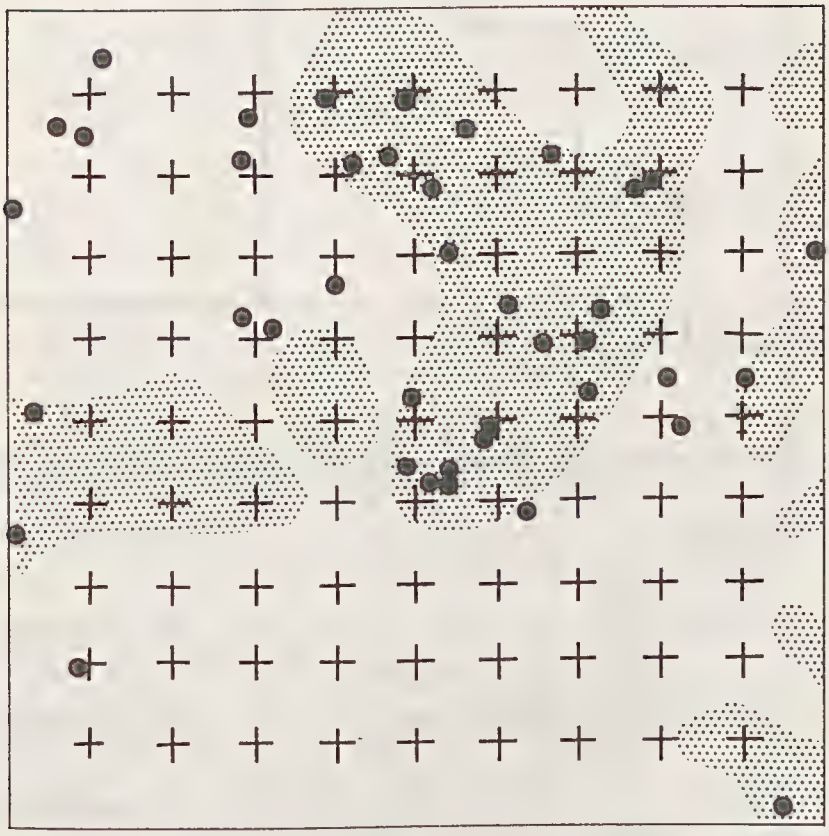
Conclusion

Under somewhat adverse conditions i.e. wide range of temperatures at the burrow mouth, low humidity, and general lack of available surface water, the development and positioning of a burrow system confers a definite advantage by providing a more constant environment than that available to non-burrowing species. Conversely the burrow has a limiting effect on behavioural strategies necessary in some other lizards for efficient thermoregulation (such as negative posturing away from the sun, raising the body from the ground etc.). On the other hand, the orientation of the burrow entrance or entrances towards, or away from the sun, make such posturing as body flattening, presence of variable pigmentation etc. redundant in this species. The advantage of a burrow system, with escape holes provides not only protection from predators, but also reduces the pre-emergence period thus extending the time available for foraging etc.

Acknowledgements

I am most grateful to H. Cogger and P. Rankin for critically reading the manuscript. T. Boylan and B. Gibson gave considerable help in gaining the field data necessary for this study.

FIG. 1: BURROW DENSITY AND DISTRIBUTION



Stippling shows areas where spinifex predominates, black circles are burrow systems. Each sub-plot = 40 ft. x 40ft.

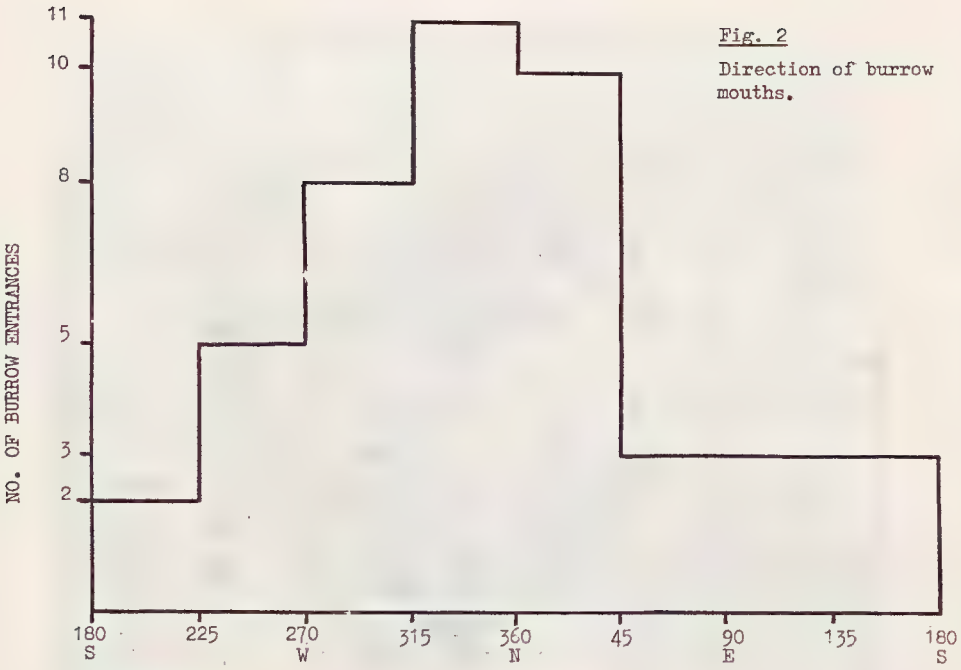


Fig. 2

Direction of burrow mouths.

References

Bustard, R. 1970: Australian Lizards. Collins.

Cogger, H.G. 1967: Australian Reptiles in colour. A.H. and A.W. Reed, Sydney.

..... 1974: Thermal relations of the Mallee Dragon Amphibolurus fordi (Lacertilia : Agamidae). Aust. J. Zool. 22: 319-339.

..... 1975: Reptiles and Amphibians of Australia. A.H. and A.W. Reed, Sydney.

Cowles, R.B. and C.M. Bogert, 1944: A preliminary study of the thermal requirements of desert reptiles. Bull. Amer. Mus. Nat. Hist. 83: 261-296.

Davey, K. 1970: Australian Lizards. Periwinkle Press, Melbourne.

Heatwole, H. 1970: Thermal ecology of the Desert Dragon Amphibolurus inermis. Ecological monographs 40(4): 425-457.

..... 1976: Reptile Ecology. University of Queensland Press.

Mcginnis, S.M. and L.L. Dickson, 1967: Thermoregulation in the desert iguana Dipsosaurus dorsalis. Science 156: 1757-1759.

Rosen, N. 1905: Lizards in the Zoological Museum of Lund. Ann. Mag. Nat. Hist. (7)16:139.

Swanson, S. 1976: Lizards of Australia. Angus and Robertson, Sydney.

Webber, P. 1978: Australian Natural History Oct. - Dec. 1978.

****

Conservation and Public Education

Programmes for Herpetological Societies.

Julian White, President - South Australian Herpetology Group

Most herpetology groups have conservation and public education listed in their constitutions as major objects of the group. Each group puts a different interpretation on the meaning of these objects, especially the meaning of conservation. However, in stating that we wish to conserve reptiles and amphibians, we are implying that we wish to ensure that they still exist in their natural habitat.

We are therefore seeking conservation of habitat as well as individual reptiles. To effectively do this, we must have knowledge of which reptiles exist, in what numbers and where, and what their habitat requirements are. I believe that there is inadequate information at present to accurately carry out such conservation.

Hence, as part of conservation, amateur herpetological groups have a duty to extend information on reptile distribution and ecology, and that this is one of the most important functions of such groups. Given the limited resources available, how can these aims be best achieved?

In the South Australian Herpetology Group we have had an active field work programme for over three years. This has taken the form of monthly trips (sometimes two, or even three times a month) to selected areas of the State collecting representative cross sections of the reptile and amphibian fauna, which is then deposited in the South Australian Museum as a permanent record of the State's herpetofauna. The trips are discussed with the South Australian Museum's Curator of Reptiles beforehand.

The whole trip, with full details of specimens collected, is then collated as a trip report, and copies sent to relevant Government authorities. The Group has a broad Scientific Permit from the State's Wildlife Authority which enables us to legally collect on trips. The cost of trips is born by the participants on the trip. Our usual practice is to pool petrol money, and each trip member pays an equal share of petrol costs but vehicle owners do not pay petrol costs. This provision allows for wear and tear on vehicles.

This trip programme has worked well, and has maximized the productivity of the Group. Such a co-ordinated programme best utilizes the human resources of the group and has the added benefit of welding the group into a cohesive organization with a strong sense of group identity.

Individual loyalty to the group's aims is strong. Our day trips are now being organized around specific research programmes. One of our members is interested in the distribution of Cunningham's Skink Egernia cunninghami, in the Mt. Lofty Ranges, and another in the ranges and overlap of the two species of Water skink found in the Ranges. Nearly all our day trips are currently designed by these two members, to facilitate the research into these three species.

We also hope to establish a long term project in an area of the Ranges, plotting individual reptile movements within the study area. This will hopefully give us precise data on reptile population densities and individual territories. It will involve tagging and recapture over a two to five year period.

To further our knowledge of individual reptile species, we are encouraging members to commence specific research programmes. These initially involve observations on captive reptiles, and specimens for such programmes come from our survey trips. The first such programme, a study of the Gekkonid genus Nephrurus has already commenced. In time we hope to have a group of herpetologists, each with a good general knowledge of our herpetofauna, but also each member being a specialist in a particular group of reptiles. In time this will produce the quantity and quality of data necessary for completely reasoned conservation.

In conjunction with surveying it is most important to support protection of habitat wherever possible for it is habitat destruction which is the real threat to herpetofauna, and not collecting.

In addition to an autonomous trip programme it is worth considering trips with other conservation oriented organisations. In S.A. the Nature Conservation Society organised an area survey, involving many specialist wildlife groups, of the Ninety Mile Desert, an area of Crown Land which it was felt should be dedicated as a Conservation Park. The S.A.H.G. sent a team which successfully carried out the herpetological side of the survey.

These activities are designed to further conservation of herpetofauna but ultimately, the real power in conservation lies with Government. Of all of Earth's animals, Governments are probably the most perverse and changeable, and are very strongly influenced by general public opinion. If the public are not in favour of reptile and amphibian conservation, then it becomes an uphill battle to get Government to work in this field. Hence, allied to the programme of field research, it is most important to have a programme of public education, to ensure that the general public support conservation of herpetofauna.

Education can be tackled at several levels. Firstly, we can help teachers, by providing the necessary educational resources in the form of literature, slides and films, and live specimens for study. In certain circumstances we should provide speakers on herpetological topics. An extension of this is the "wildlife exposition", which brings under one roof a wide variety of faunal resources for study. Two examples of this from S.A. are the 1972 and 1973 Native Wildlife Shows, and the more recent Poisons Week Show at the S.A. Museum.

Such shows can, however, be very costly, both in time and money and stretch the resources of a small wildlife group beyond the limit. Probably the production of more frequent small exhibits is of greater value, and these can be presented at Museums, Zoos, and even schools themselves. Such small displays, kept open for a longer period and seen by a smaller number of students, allow closer study by the individual student, and so increase the educational impact. We have had some success with this sort of exhibit in South Australia.

Our most ambitious exhibit of this latter type, is the Cleland Interpretation Centre display on Reptiles and Amphibians of Mount Lofty Ranges. Although having only three vivaria with live exhibits, it is an integrated pictorial display, showing the herpetofauna of the Ranges and it explains the ecology of the reptiles and amphibians of the area and how man's activities affect them. It's ultimate message is the conservation

of amphibians, reptiles and their habitats.

This complex display at Cleland has cost in the vicinity of $10.000 and has involved thousands of man hours.

Displays such as Cleland and the Wildlife Shows, also reach the general public and so go part way towards our goal of general public education. However such displays are unlikely to be frequent, and small displays at Royal Shows, Banks and shopping centres also help. We can also look to the use of the media, including television and the press. Most States have locally produced children's magazine programmes and it is relatively easy to feature on these, presenting herpetological information to children this way. If well done, many adults will also see the information. This has been the experience in S.A.

Production of educational leaflets and short books on herpetology is also worthwhile. The Western Herpetology Group have done this with their booklet on the Snakes of Eyre Peninsula.

Another area of public education is the use of public education lectures. In S.A. the Adult Education Programme has organised a series of lectures on snakes. This series was produced and presented by Geoff Coombe, and proved so successful in its first year, that it is being repeated this year.

There are without doubt other areas of public education especially those that are built on local interests and issues.

In summary, conservation of herpetofauna must be one of the primary aims of amateur wildlife organisations, and this is best achieved by a combination of field work, research, and public education.

****

Hisses and Croaks.

THE AFFILIATION:

In less than a month the second AAHS Convention will be upon us! Hopefully you will be there. The first Convention at Wilcannia a year ago was a lot of fun and very worthwhile the second should be even better! (See also the Editorial).

At their August 1978 General Meeting the Australian Society of Herpetologists decided to accept the Affiliation's offer to bulk subscribe to Herpetofauna on behalf of members who wished to receive the journal. They decided to leave the question of joining the Affiliation until a later date.

Arrangements are well in hand for the setting up of a radio link-up between member societies. It is hoped that we can have a get together "on the air" (with all member societies participating on the one evening) about once every three or four months. The details will be worked out at the Whyalla Convention.

ADELAIDE:

The second half of 1978 saw a slight reduction in field work. Two major surveys were undertaken, one to the Mambray Creek area and another to the Innes National Park.

However the 1979 field program is a busy one with day trips concentrating on local problems such as the distribution of Water Skinks and Cunningham Skinks in the Mt. Lofty Ranges, and searches for the elusive and rare Pigmy Bluetongue (Tiliqua adelaidensis).

A more ambitious ten day visit to the Everard Ranges in the far north of the state is also planned. The SAHG will also provide all the support we can to the Western Herp Group hosting the second Convention in March.

In 1978 many thousands of visitors to the Royal Show saw our free exhibits of large live reptiles. A donation box was a great fund raiser. The Cleland Education Centre was opened by the Minister for Environment and Conservation in September 1978 and the live and graphic display of reptiles and frogs has proved very popular.

MELBOURNE:

VHS has embarked on a training program for younger members in field work methods and techniques. Very successful day trips have been run to Cobbeldick's Ford and Ballan and more are planned for 1979.

Our Newsletter is very popular amongst members, particularly those who can't get to meetings. But we are having real problems getting enough material; we would greatly appreciate permission from other societies to reprint (with acknowledgements) the occasional article from their newsletters.

As a society project in 1979 we hope to do more captive breeding studies by getting members to pair up their un-mated reptiles. Meetings will include sessions on how to sex, pair-up and provide ideal conditions for breeding and egg hatching.

It is now illegal to collect reptiles or frogs in Victoria without a permit although the regulations have not yet been published. The VHS has been licenced to collect for the National Museum of Victoria.

NEW ZEALAND:

Fieldwork by the Society included trips to Great Barrier Island during August 1978 and over the Christmas - New Year period. These trips have been major and comprehensive surveys of the Island's reptile life.

Society members have been invited to address naturalist and conservation groups in the Auckland area, and several valuable lectures have been given. More are planned.

Members have sent in their 1978 Annual Returns and these are now being analysed. Only a limited number of species are being kept and breeding and keeping successes can be easily studied. Members are being urged to preserve all specimens that die in captivity and donate them to museums or universities.

QUEENSLAND:

There is a large group of herpetologists in Queensland interested in reforming a Society. However several problems have yet to be overcome. The repressive protection legislation in Queensland would seem to be at the heart of the problems. The Affiliation member Societies will gladly give any advice they can.

Constructive advice and comment from interstate of Queensland's unnecessarily harsh law and regulation enforcement is viewed with mistrust and suspicion and is seen as meddling by the Queensland fauna authorities. Anything said outside the state could harm the cause of Queensland herps and comments and changes will have to come from within Queensland.

SYDNEY:

The AHS membership has increased markedly thanks to the efforts of John Edwards (Vice President). In his professional capacity as an itinerant lecturer to NSW schools he has met many students and teachers who are interested in joining the Society.

Public education efforts have included guest speaking to various clubs and in early 1979 an exhibition of reptiles and frogs is planned at Parramatta. An information circular about the Society has been printed and the second of the popular six-month agenda cards has been finalised.

Field work has centred on the Colo Wilderness Area where Survey work is being conducted in conjuction with the Australian Museum. More monthly trips to that area are planned in the first half of 1979. Other trips are planned to the Macquarie Marshes and the Mt. Koskiusco areas.

The second AAHS Convention at Whyalla should be well attended by the AHS - about twelve members are planning to go.

WHYALLA:

We are flat out with arrangements for the Convention next March besides our normal work at the Fauna Park and some field studies of the local dragon lizards.

Field trips over the past six months included visits to the Gawler Ranges, Elliston and the Sir Joseph Banks Islands. Future trips include the Lake Gilles area and continuing visits to the Sir Joseph Banks Islands.

The pre-fab conference room at the Fauna Park has proved to be an ideal meeting place/lecture room. Last year we addressed the public and school groups on local fauna and conservation. A booklet/identification guide to Eyre Peninsula's venomous snakes is being prepared for public and medical use.

We welcome as many of you that can possibly come to Whyalla for the Convention - the best in accomodation, venues, field work and informal sessions have been arranged.

****

Rough-Scaled Snake, Tropidechis carinatus.

by Donald J. Beard c/- Education Officer, P.O. Box 71 East Maitland 2323

HISTORY:

This small to medium sized elapid snake was first described by Krefft in 1863, from a specimen collected near Grafton, north eastern New South Wales. The common name, Rough-Scaled Snake, is derived from the strongly keeled dorsal scales, which give the snake a rough appearance. Other common names are - Clarence River Snake, Arrow-Naped Snake, Arrowhead Snake, Water Tiger.

Synonymous names:	Hoplocephalus carinatus	Krefft
	Tropidechis carinata	Krefft

DISTRIBUTION:

Found from the Barrington Tops, west of Taree in mid-eastern New South Wales, northwards to the Nambour district south-eastern Queensland, then from Tully to near Mossman in north-eastern Queensland, extending inland as far as Mount Molloy on the Atherton Tablelands. Most common in the Clarence River district of New South Wales, although often met with in the lesser populated areas behind the Gold Coast of Queensland.

Cogger considered the northern and southern populations might be discontinuous. This apparent absence from large areas of coastal, central and far north Queensland could be attributed to the species preference for relatively cool moist regions. Frauca reported a specimen from the Bundaberg area, but as this was destroyed before detailed examination could be undertaken, the range cannot be extended to include this region.

DESCRIPTION:

The body in elongate and rounded. The tail is quite short, approximately 14mm long in a large specimen, not distinct from the trunk, tapering, ending in a conical spine. Head broad, quadrangular, distinct from the neck, with slight canthus rostralis, snout prominently flat, short and broad. Eye moderate with a rounded pupil. The second upper labial, anterior ocular and posterior frontal bend down on the sides. Seven upper labials, the third and fourth touching the orbit. Scales rather narrow and elongate somewhat broader anteriorly, strongly keeled on the dorsal, neck and mid-body forming fourteen raised lines on the back and sides. Keeling of scales less evident laterally, or may be absent, while the scales on the sides are smooth.

COLORATION:

The dorsal coloring of this snake ranges from olive-green through olive-brown, grey, to dark brown with or without irregular interrupted blackish coloured blotches or transverse bands, which do not extend as far as the ventral scales. These 'bands', up to 60 in number, are most conspicuous anteriorly and may be broad and regular or narrow and irregular commencing immediately behind the head and extending along the body for half to two-thirds the body length. The skin between the scales is black. The tail is usually unmarked, but in some specimens it may be lightly flecked with black. The lips are yellowish-white in colour.

Ventral coloration creamish-yellow, olive-green or white, being clouded with purplish grey to olive blotches on the sides, becoming much darker towards the tail, which is of a uniform purplish colour below.

HABITAT:

This snake is usually encountered in close proximity to water and has been found in such areas as open Eucalyptus forest adjoining low-lying swamps; wet sclerophyll forest; open forest with blady grass (Imperate cylindrica) and (Lantana sp.) in hilly country; highland rain forest - both sub-tropical anf tropical; open grassland in areas formerly covered by rain forest; canefields surrounding creeks still enclosed by dense forest; near paper bark tea-tree (Melaleuca viridiflora) swamps and along the banks of stony creeks and streams.

There is some difference of opinion concerning this snake's habits. Gow records it as being diurnal in habit, becoming semi-nocturnal during warm weather. Cogger records it as being nocturnal, while sometimes seen basking in the sun or foraging for food during the day. Worrell records it as being partly nocturnal.

FOOD:

The diet of this snake consists of frogs, small mammals and reptiles. In captivity it shows as marked partiality for mice. whilst in the wild it has been noted to have a liking for marsupial mice.

GENERAL:

The young are live born, and the litter size numbers upwards to seven.

This snake is a difficult and dangerous species to handle, especially if held by the tail, thrashing about wildly in an endeavour to bite, also having the ability to strike upwards from this position. It was after a bite by one caused the death of a man in five minutes in January 1059 that this species, which had until then been considered only slightly venemous, was recognised as being a distinct danger to man. The fangs are relatively large, and venom can be delivered to a reasonable depth. In striking, this species is more accurate than the Death Adder (A. antarcticus), Tiger Snake (N. scutatus) or Black Snake (P. porphyriacus).

In describing this species, the following authors remarked on the disposition of T. carinatus:

Worrell: "normally not agressive".

Fleay: "that it is persistently pugnacious, lunging fast and furiously with coughing hisses when approached. Captivity does not mellow it and I regard it as the 'fightingest' small snake I've ever encountered - one that is more likely to retaliate when approached than most others".

Kinghorn: "It is very savage when first captured".

Millar: "highly venomous, and when first captured tends to assume a striking stance at any provocation and to bite on being molested. After a period of captivity, it quietens down to some degree, though it remains temperamental and while on one day it may not assume a striking stance when a hand is moved near it, it may on the next day move forward and strike repeatedly".

When angered, it will savagely chomp its jaws, and with the large venom glands protruding from the side of the head, it gives the snake a distinct 'arrowheaded' appearance.

In areas where T. carinatus is sympatric with the Fresh-Water Snake, A. mairii, to which there is a strong superficial resemblance, herpetologists are advised to exercise extreme caution. Colour and appearance alone are not enough to separate this snake from the latter, an accurate scale count being the only proven method when this species is concerned. The main obvious difference in these two species is the lack of a loreal scale in T. carinatus, which is present in A. mairii.

The pugnacity when provoked, and the unpredictable temperament of this species makes it a snake best left alone. In areas where this species and A. mairii overlap, a bite from a snake matching the description of both, i.e. olive-brownish coloration, should be treated as a potentially dangerous bite and appropriate measures taken. The venom of T. carinatus is powerfully neurotoxic. Tiger Snake Antivenene is effective in giving protection in this snake's bite, effectively neutralizing the venom. If unavailable then polyvalent antivenene (Australia-New Guinea) effectively neutralizes the venom.

Reference Material and Further Reading:

Cogger, H.G. (1967), Australian Reptiles in Colour, Reed, Sydney.
Cogger, H.G. (1975), Reptiles and Amphibians of Australia, Reed, Sydney.
Covacevich, J. (1970), The Snakes of Brisbane, Qld. Mus. Publ.
De Vis, C.W. (1911), Descriptions of Snakes Apparently New, Ann. Qld. Mus. 10:21.
Fleay, D.H. (1961), Beware - This Small Snake is Dangerous, Vic. Nat. 77:284.
Garnet, J.R. ed (1968), Venemous Australian Animals Dangerous to Man, Parkville Commonwealth Serum Laboratories.
Gow, G. and Swanson, S. (1977), Snakes and Lizards of Australia, Angus and Robertson, Sydney.
Hunt, R.A. (1947) A Key to the Identification of Australian Snakes, Vic. Nat. 64(8): 159.
Kinghorn, J.R. (1956) The Snakes of Australia, Angus and Robertson, Syd.
Krefft, G. (1863), Description of a New Species of Hoplocephalus with Keeled Scales, Proc. zool. Soc. Lond., :86
Millar, D.D. (1963), A Preliminary Study of the Habits and Venom of Tropidechis carinatus, (Serpentes: Elapidae), Herpetofauna, 1:3.
Ormsby, A.I. (1951) Venemous Land Snakes of N.S.W. and their comparative Danger to Man. Proc. Roy. zoo. Soc. N.S.W., :39.
Reilly, V.M. Nth. Qld. Nat. 31 (133) :4
Serventy & Raymond, Aust. Wildlife Heritage 4(50) :1572
Trinca, Grayden, Covacevich, Limpus (1971) Med. J. Aust. 2: 801
Waite, E.R. & Longman H.A. (1920) Descriptions of little known Australian Snakes, Rec. S. Aust. Mus., 1:173
Worrell, E. (1963) Reptiles of Australia, Angus and Robertson, Sydney.

Herpetological Notes.

THE TRILLING FROG FOUND ACTIVE IN A HOT WATER BORE POOL.

by J. White, 4 Elderslie Avenue, Prospect, S.A. 5082.

On a recent expedition up the Strzelecki Track I discovered a small population of Trilling Frogs Neobatrachus centralis (Parker), resident in and around the overflow pools of Montecollina Bore (Lat. 29°24'S Long. 139°59'E). The bore was sunk many years ago, and water emerges from the pipe at near boiling point. From there, it flows through a series of small pools (approx. 10m diam.), and out onto the flat white sand areas around the bore. I observed a population of approximately 10 males calling from the inundated sandy areas. However, one male was found calling in the warmest of the overflow pools. Water temperature was estimated at 40°C and steam was rising from the pool. Yet this lone male was happily sitting amongst the algae in this pool, calling regularly. Needless to say, when finally captured, it was a very hot and active frog. Its body temperature was that of the water, namely 40°C. This is the first time I have ever collected a South Australian frog in such high environmental temperatures, and no other herpetologist in this State can recall finding such overheated frogs.

****

RANGE EXTENSION FOR CHELOSANIA BRUNNEA.

by G. Husband, 21 Edward Street, Guildford, N.S.W.

Little seems to have been published on the distribution of the Swelled-headed Dragon, Chelosania brunnea and the following record could represent a significant extension to the known range of the species.
Worrell (1963) reported its distribution as being Western Australia and the species appeared to be confined to that state until the early 1970's when material from the Northern Territory became known. Cogger (1975) expanded the distribution to the Kimberley region, W.A. and western Arnhem Land, N.T.
On the 30th December, 1977 the author accompanied by Mr. J. Sauer, discovered a large (total length ca.360mm) adult C. brunnea active on the Stuart Highway, 10km north of Daly Waters, N.T. The specimen was walking slowly across the road at 0905 hours in an area of low to medium Acacia woodland with continuous ground cover of Sorghum Sp. grass.
The lizard's colouration and markings were similar to that given by Cogger (1975) with the dorsum being of the grey-brown phase rather that the yellowish. When initially approached, the specimen became motionless and lowered itself flush with the bitumen; it lay prone until seized. During handling it became quite aggressive, attempting to bite with little provocation. A bite received was surprisingly strong for a lizard of its size.
After photographing (see fig. 1), it was placed in a small broad-leafed bush beside the road where we observed its movements for a short period. When moving through the branches it was very chameleon-like, slowly almost mechanically moving from point to point on the bush. The specimen was released at the capture site as we did not have a collecting permit.

REFERENCES

Cogger, H.G. (1975), Reptiles and Amphibians of Australia. Reed, Sydney
Worrell, E. (1963), Reptiles of Australia. Angus and Robertson, Sydney

****

figure 1 Chelosania brunnea.

figure A Leiolopisma homalonotum

RANGE EXTENSION FOR LEIOLOPISMA HOMALONOTUM (BOULENGER)

by J.A. West, 4 Cradock Street, Avondale, Auckland 7, N.Z.

A single live specimen of L. homalonotum was found at Tryphena, Great Barrier Island (90km N.E. of Auckland), N.Z. on 31st August 1978 at 1005 NZST. It was found lying on the dusty metalled road at Gooseberry Flat (Lat. 36°18'S Long. 175°29'E) 0.5km north of Tryphena Post Office. The skink could have fallen off a moving behicle or more probably come from a recently cleared area in Manuka Leptospernum scoparium scrub. Weather conditions were cloudy and mild with little wind. The specimen was an adult (sex uncertain) with a partially regrown tail. (see figure A).
Measurements: (all dimensions in millimetres, ± 0.5mm).
Snout-vent 125.0; axilla-groin 72.0; snout-forelimb 37.0; snout-anterior of ear 21.5; posterior of ear-forelimb 17.0; head width 16.5; head length (snout-nuchal)19.5; vent-break in tail 34.0; regen. portion of tail 39.5.
A total of six specimens have been found in the wild since it's discovery in 1905. This rare skink is believed to be restricted to Great Barrier Island N.Z. Hardy (1977) in 'N.Z. Scincidae (Reptilia: Lacertilia); a taxonomic and zoogeographic study' N.Z. Journal of Zoology. 4(3) :238 gives the known localities of L. homalonotum. These are Okiwi, Karaka Bay and Katherine Bay. All are northern localities on the east coast of the Island. The southern-most, Okiwi, is 20km north of Tryphena. The discovery of the Tryphena specimen extends the range of L. homalonotum to the southern end of the Island.

****

BRIEF OBSERVATIONS ON TORTOISES IN MINKIE WATERHOLE, INNAMINKA

by J. White, 4 Elderslie Avenue, Prospect, S.A. 5082.

Many herpetologists will know that the inland waterholes of the Cooper-Diamantina drainage system contain tortoises. These tortoises appear to be a species of Emydura, but lack the distinctive lateral facial stripes of the better known species. I consider that further investigation will reveal them to be a new species of Emydura, possibly derived from Emydura krefftii (Gray). Populations of this reptile have been observed in most of the permanent waterholes of Coopers Creek, around Innaminka, and also the Coongie Lake area. They presumably exist in most of the permanent waterholes and lakes of this region, although insufficient data is currently available to confirm this assumption.
Recently I had an opportunity to observe these tortoises at first hand. Observation from the bank of the Minkie Waterhole revealed several small populations of this tortoise. Though weather conditions and bank topography were ideal, no specimens were seen basking. All observations were of mobile specimens, thrusting their entire head out of water. This usually occurred in deep water. They would apparently look from side to side, and sometimes had their head out for periods in excess of fifteen minutes. The shell was never visible, and they did not exhibit the typical water surface basking behaviour of Emydura macquarii (Gray). All specimens observed were approximately 20cm in carapace length, as estimated from head size and body proportions of captured specimens.

****

TAIL SPLITTING IN HOPLODACTYLUS GRANULATUS.

By R.P.V. Rowlands, 6 Tobruk Crescent, Milford, Auckland 9, N.Z.

The Forest Gecko (Hoplodactylus granulatus) is able to build up fat reserves in the base of the tail; in wild specimens it may become quite plump during the summer if food is plentiful. In captivity care must be taken to avoid overfeeding, which can cause the base of the tail to become grossly distended. One specimen in my collection had a regenerated tail, and, due to the large amount of food consumed by this particularly voracious individual, the area where the regenerated tissue joined the stump of the original tail became swollen with accumulated fat.
Although I had been told that these geckos could be overfed to the stage that their tails would split, I had dismissed this idea as nonsense; and was therefore not prepared for what happened next. The regenerated tissue started to split away from the original, and after two weeks, the split extended around approximately two-thirds of the circumference of the tail. At this stage, with raw tissue protruding from the split, it appeared that infection could be commencing. The whole tail was removed and the stump treated with "Panalog" veterinary ointment. Healing was satisfactory and regeneration to date is apparently normal.

****

REMARKS ON THE LONGEVITY OF VARANUS VARIUS.

by K.J. Kennerson, 46 Berith Road, Wentworthville, N.S.W. 2145

The following note refers to a captive specimen of Varanus varius, which appears to represent a life-span record.
During April 1963, an adult Bell's variant of V. varius was collected near Coonamble N.S.W. (Lat. 30° 58'S Long. 148° 23'E) by Mr. B. Champion of Sydney. The specimen, a mature male, was not measured when secured, but was estimated to be approximately 1.2 metres in total length. The collector maintained the lizard in a wired enclosure for 3 years 5 mths. It was then passed on to Mr. R. Wells who kept it for an additional 2 years in an outdoor fibro-walled pit, (4m X 6m). In September, 1968 it was given to the author who kept it in another fibro-walled pit (10m X 3m) until its death on the 24th November, 1978, a period of 10 years 2 months. The specimen had been kept successfully under captive conditions for a total period of 15 years 7 months.
It is interesting to speculate that this species could have a life span perhaps approaching or even exceeding 20 years. Flower (1937) cites a recorded maximum of 15 years for a specimen.
While in captivity the specimen took the following food; raw beef, duck and chicken eggs, sparrows, road killed Tiliqua scincoides and Amphibolurus barbatus, occasionally stray cats that wandered into the enclosure and rabbits, mice, rats and young chickens.
The specimen which is now in the Australian Museum (R81026), was killed by dogs.

ACKNOWLEDGEMENTS
I wish to thank Mr. B. Champion of Greystanes and Mr. R.Wells of Blacktown for relevant information. This specimen was kept under authority R330 from the National Parks and Wildlife Service and their assistance is gratefully acknowledged.

REFERENCES
Flower, S.S. (1937) Proc. Zoo. Soc. (London) 1937 : P 1.

****

Notes to Contributors.

"Herpetofauna" publishes original articles on any aspect of reptiles and amphibians. Articles are invited from any interested authors; encouragment is given to articles reporting field work and observations.

1. PUBLICATION POLICY
Authors are responsible for the accuracy of the data presented in any submitted article. Current and formally recognised taxonomic combinations should be used unless the article is itself of a taxonomic nature proposing new combinations or describing new species. Upon publication, copyright in the article (including illustrations) become the property of the Affiliation. The original illustrations will be returned to the author, if requested, after publication.

2. SUBMISSION OF MANUSCRIPT
One copy of the article (including any illustrations) should be submitted, the author retaining a second copy. All material should be typewritten or clearly hand-written and double spaced. Grammar and punctuation should be checked and all pages must be numbered consecutively. The metric system should also be used throughout. All scientific names and subheadings should be underlined. The author's name and address should appear under the title. Latitude and Longitude of localities mentioned should be indicated.

3. ILLUSTRATIONS
Illustrations (drawings, maps or photographs) should be twice the anticipated published size if possible. Drawings should be in Indian ink on high quality, matt white paper. Authors should retain a copy of each illustration.

4. REFERENCES
Any references made to other published material must be cited in the text, giving the author, the year of publication and the page numbers if necessary, e.g. Jones (1968, p24). At the end of the article full reference should be given. (See this journal).

5. PROOFS
If any changes, other than minor ones, need to be made to the article, a proof with suggested changes will be sent to the author for his revision. Proofs should then be re-submitted by the author as soon as possible.

6. REPRINTS
Free reprints for authors are beyond the financial resources of the Affiliation. Authors of articles who are members of an affiliated society will receive their copy in the normal way. Other authors will have posted to them one copy of the issue of Herpetofauna in which their article appears. Additional copies of Herpetofauna can be purchased from the Editor by authors for $A1.00 per copy.

****

HERPETOFAUNA.

Vol. 10 No. 2 20th February, 1979

CONTENTS.

Printed by Printwrite, 107 Walker Street, North Sydney
Telephone: 922 1218